

QUIZ # 1

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- 45 Minutes. No materials are allowed (Number) indicates weighting
- No interaction with another student is allowed during the exam. Cheating will not be tolerated

1. Numbers are stored in the order in which they are printed out in Little Endian. (0.4)2. There are two ways to represent real numbers in computer. Which one is faster and more accurate? (0.4) Binary3. From flip-flops and latches, which one are level sensitive? (0.4) Latches

4. What are the functions of the accumulator register in a computer arithmetic/logic unit? (1)

to store and send values

5. How many pins are required for a 16K x 8 RAM with common I/O and one CS input? Consider other pins as well if necessary. (1)

6. The MCM6209C is a 64K x 4 static RAM chip. How many of these are needed to form a 256K x 16 module? (1)

7. Determine how many bits each of the following registers can hold? (0.7)

PC, DAR, IR, DR, ACCA, Address Latch/Buffer, Data Buffer

8. Assume that initially [PC] = C807, [A] = 09, and [C457] = 08. (0.6)

C807	BB	; ADDA
C808	C4	
C809	57	

At the completion of this instruction, [PC] = C808, [A] = 11, and [C457] = 09

9. Examine the following 68HC11 MPU program and answer the following questions: (2)

E230	B6	; LDAA
E231	F6	
E232	07	
E233	B0	; SUBA
E234	F6	
E235	07	
E23D	3E	; WAI

- (a) How many times does the address F607 appear on the address bus? 2
- (b) How many times does the MPU perform a memory READ operation except WAI instruction? A WRITE operation? 3 read 1 write
- (c) How many times is a new word loaded into the IR? 2
- (d) How many times is a new word loaded into the DR? 1
- (e) How many times is a new word loaded into ACCA? 1
- (f) What are the final contents of ACCA? [A] = 1F
- (g) Repeat problem (b) including WAI. 3 read 1 write

10. Assume that the following operands are initially stored in data memory: [C350] = 0A, [C351] = 01, [C352] = FF. (2)

C300	B6	; LDAA
C301	C3	
C302	50	
C303	B0	; SUBA
C304	C3	
C305	51	
C306	27	; BEQ
C307	03	
C308	B7	; STAA
C309	C3	
C30A	52	
C30B	3E	; WAI
C30C	??	

7. Determine how many bits each of the following registers can hold? (0.7)

-0.4 PC, DAR, IR, DR, ACCA, Address Latch/Buffer, Data Buffer

8. Assume that initially [PC] = C807, [A] = 09, and [C457] = 08. (0.6)

C807 BB ; ADDA
C808 C4
C809 57

At the completion of this instruction, [PC] = 330A, [A] = 1, and [C457] = 08.

9. Examine the following 68HC11 MPU program and answer the following questions: (2)

E230 B6 ;LDAA
E231 F6
E232 07
E233 B0 ;SUBA
E234 F6
E235 07
E23D 3E ;WAI

- (a) How many times does the address F607 appear on the address bus? 2
- (b) How many times does the MPU perform a memory READ operation except WAI instruction? A WRITE operation?
2 read 1 write
- (c) How many times is a new word loaded into the IR? 2
- (d) How many times is a new word loaded into the DR? 1
- (e) How many times is a new word loaded into ACCA? 1
- (f) What are the final contents of ACCA? [A] = 96
- (g) Repeat problem (b) including WAI. 2 read 1 write

10. Assume that the following operands are initially stored in data memory: [C350] = 0A, [C351] = 01, [C352] = FF. (2)

C300 B6 ;LDAA [C] = 0A
C301 C3
C302 50
C303 B0 ;SUBA [C] = 0A - 01 = 09
C304 C3
C305 51
C306 27 ;BEQ
C307 03
C308 B7 ;STAA
C309 C3
C30A 52
C30B 3E ;WAI
C30C ??

- (a) What will be [A] and [C352] at the completion of the program? [A] = 09 [C352] = FF
- (b) Assume that [C351] = 0A initially and repeat (a). [A] = 00 [C352] = 00

11. A certain program has the op code for a BEQ instruction at address 07A2. What offset should be used to cause branching to 07BC? (0.5)

-0.5 18h
240d

3C 1011 1000
- 42 1010 0000
1 0001 1000

3.6 /10